

## **HIGHWAY 40 FUNCTIONAL PLANNING STUDY**

### **EXECUTIVE SUMMARY**

This report summarizes a 44.7 km Functional Planning Study for Highway 40 from Highway 1A to Highway 579. The first 26.1 km is through deeded lands under the jurisdiction of the M.D. of Rocky View, Summer Village of Waiparous and M.D. of Bighorn. The remaining 18.6 km is in the Forest Reserve and also under the jurisdiction of the M.D. of Bighorn.

AMEC Infrastructure Limited (AMEC) was commissioned to carry out the study according to the Terms of Reference dated July 26, 2000.

The proposal by AMEC following the Terms of Reference, established a well-defined process and methodology for the study. Included in the process was an invitation to the M.D. of Rocky View, M.D of Bighorn and the Summer Village of Waiparous to have a member from each jurisdiction represented on a Technical Review Committee ("TRC"). At the Initiation Meeting on October 31, 2000, the Terms of Reference, AMEC's proposal and the role of the TRC was reviewed in detail so that there was a clear understanding of the purpose and process of the study. It was established that the main function of the local TRC members was to ensure that the communities were informed of the purpose, process and status and to communicate issues and concerns to the TRC.

The process, as outlined in the proposal and shared with the TRC, identified highway standards/safety, access locations, service provided, environmental issues, social issues, land use, terrain, water courses, bridge structures, historical issues, utilities and construction costs as the main factors to be considered in the study. Specialists responsible for providing input on these respective issues were included in the Consultant Team.

The purpose of the study was to define a highway alignment that meets both current and future requirements of a primary highway. Because of the increasing traffic volumes and deterioration of the existing surface, maintenance costs have reached the point where major rehabilitation or new construction is required. The existing geometrics are very

poor in many areas, which is a safety and operational concern. An additional study requirement was to define construction priority areas.

This section of Highway 40 has had several different designations and has served various purposes over its long history. The original route from Highway 1A to the Forest Reserve provided access to early ranching operations. In the 1940's the highway became part of the Forestry Trunk Road extending from Coleman to Grande Prairie. This section of the highway was gazetted as a primary highway on March 31, 1990. Over the years, spot improvements have been made to accommodate the increasing traffic volumes. The existing road top width ranges from 7 meters to 12 meters and the surface varies from gravel to oil to light pavement.

This highway is classified as a Subsystem 3 (Regional Route) under Alberta Transportation's Service Classification System. A Subsystem 3 highway serves as collector route to major highways and trading centers. The 2000 Average Annual Daily Traffic (AADT) ranges from 1050 (ASDT 1310) north of Highway 1A to 250 (400 ASDT) at the Forest Reserve Boundary to 160 (ASDT 270) at Highway 579. Tube counts obtained at the beginning of the May long weekend indicate peak volumes are greater than twice the normal traffic.

The determined design standard is RAU-209-110 except through the Summer Village of Waiparous where an urban design with a 50 km/h design is proposed to stay within the existing 20 m right of way where possible.

The latest collision statistics provided by Alberta Transportation (October 2000) show a collision rate of 118 per 100 million vehicle kilometers, which is similar to the provincial average of 121 per 100 million vehicle kilometers on gravel primary highways. The statistics indicate that 57.7% of the collisions are run off road and 34.6% are animal related. The high percentage of run off road is likely as a result of the narrow surface and poor horizontal curves. Based on comments made by local people the run-off road is much higher because there are many situations where accidents occur but are not reported. There are no special monitoring locations identified.

In addition to having representatives from the local jurisdictions on the TRC, the public involvement process included an open house public meeting to initiate the study, a survey questionnaire, periodic newsletters, meetings/discussions with identified stakeholders, meetings with landowners where acceptable to the TRC representatives, responding to letter and phone calls and an open house public meeting to present the recommendations. Referral letters were sent to provincial government agencies and followed up with meetings where required. Referral letters and discussions with the Federal Department of Fisheries and Oceans were also part of the process.

Based on previous studies, traffic patterns, service provided and the need to improve the existing highway, the study concentrated on following the existing corridor as much as feasible. The options of following the Richards Road, Jamison Road and Highway 579 raised through the public involvement process do not meet the objectives of the study. The section with the highest traffic volume from Highway 1A to the Summer Village of Waiparous would not be included in these options, resulting in a major duplication of roads and would not address the poor condition of the existing highway.

Generally following the existing corridor was the obvious and supported route except for the Waiparous area where the standards are poor, the one lane restricted Waiparous Creek Bridge is nearing its life expectancy and there are significant social issues. The study was divided into four sections so construction priorities could be established and the most complex section in the Waiparous area where seven alternatives were involved could be compared with common terminal points.

**Section 1 km 0 – km 11.0 (Estimated Cost is \$7.4M)**

The recommended alignment generally follows the existing highway with curve improvements and access changes to meet the required design standard. This section is recommended as the highest priority for construction mainly because of the high traffic volumes and poor existing curves.

**Section 2 km 11.0 – km 18.2 (Estimated Cost is \$13.5M)**

Because of the poor existing alignment and high social impacts within the Summer Village of Waiparous, seven alternatives were compared. The objective was to determine if there was a feasible alternative to following the existing corridor. The seven

alternatives included two bypass alternatives to the south, two bypass alternatives to the north and three alternatives within the Summer Village. The study concluded that the alternatives within the Summer Village created major social concerns. However, the bypass options to avoid the Summer Village have numerous negative factors that were considered in the comparison. The environmental impacts created by another road corridor through natural areas, has major environmental implications. The south bypass options each require two new crossings of the Ghost River and the two north bypass options each require extremely high bridge crossings of Waiparous Creek and would also restrict wildlife movement. Because the bypass options have such high environmental impacts an additional and more detailed environmental assessment was included in the study. The information from the additional study increased the environmental concerns with respect to fish, animals and plants particularly on the south bypass route. The south bypass options would likely require a comprehensive environmental impact assessment to be reviewed by the Federal Department of Fisheries and Oceans. The bypass options have higher historical resource impacts, increased costs of \$9.1 million comparing Alternative A to Alternate B-4, results in duplication of roads and negative visual impacts created by the large cuts and fills. The study recognized that the bypass options also have social impacts although considerable less than the options through the Summer Village. The north bypass options with major environmental impacts, high costs and minimal support were eliminated in favor of the south routes as bypass options. Based on a comparison of social, environmental and historical resources impacts, Alternative B-4 was selected over Alternatives B-1 and B-3 for the options within the Summer Village. Based on social impacts, environment impacts, costs and duplication of roads, Alternative A was selected over Alternative A-1 for the south bypass option.

While public opinion is an important component of the study, it cannot always be used in the detailed comparison because the varying reasons for a preference are difficult to measure. However, public opinion on broader issues such as social issues, environmental concerns, safety, landuse impacts and costs are very beneficial and are considered in the overall evaluations. Although the recommendations of this study following the Terms of Reference are based on an objective approach, the implementation will likely be influenced by public opinion. Therefore, it is important to

note that in the larger regional community, there is significant support for following the existing corridor as compared to major alignment changes through undisturbed lands.

The seven alternatives were compared by developing a criteria for ranking the alternatives. The factors considered in the comparison are costs, social issues, environmental issues, historical resources, land acquisition, duplication of roads and regulatory justification. Costs, social issues and environmental issues were given an equal rating of 0 – 20, historical resources were rated 0 – 7 and land acquisition, duplication of roads and regulatory justification were each rated 0. Because of the various categories of social issues, a weighting was developed for each category. These comparisons were summed up on a comparison chart with Alternative B-4 having the least overall impacts. Alternative B-4 had less social impacts than the other two alternatives through the Summer Village because it generally follows the existing highway. Realizing that the ranking and weighting of the various factors and categories would be a subject of debate and criticism different values were used to test the model. The results of these exercises were reviewed extensively by the consultant team and senior staff in AMEC Infrastructure Limited with the conclusion that the comparison provided is defensible.

Based on the overall comparisons, **Alternative B-4 is the recommended alignment.** This alternative includes a new crossing of Robinson Creek some 400 meters downstream from the existing crossing. Although based on traffic volumes and existing road conditions, this section would rank as Priority 2 for construction, it is recommended as a Priority 3 to allow lead time for right of way negotiations, design involving mitigative details and adjustment for the residents.

### **Section 3 km 18.2 – km 26.1 (Estimated cost is \$4.9M)**

The recommended alignment generally follows the existing highway with curve improvements and access changes to meet the required design standard. This section is recommended as the fourth priority for improvements.

**Section 4 km 26.1 – km 44.7 (Estimated ultimate cost is \$10.2M, First stage \$5.1M)**

A location study carried out in 1984 established an alignment for this section and approximately 8.8 km were constructed under a spot improvement program in the following years. The current study reviewed the previous established alignment and recommended it be basically adopted with minor revisions to the horizontal and vertical alignment. Most of the right of way, which is through crown land, has been obtained and much of the right of way was cleared. The remaining 9.8 km that is still the original forestry road is recommended as Priority 2 for construction. It is recommended that it be constructed as a gravel stage for the foreseeable future.

This study has created both positive and negative reaction, however, there is strong support for the highway to be improved. This study in addition to the 1982 study and the 1987 study for improvements within the Summer Village have left the whole community in a state of uncertainty. Development plans have been affected and potential impacts to property, particularly in the Summer Village are constant concern. If the recommendations of this report are approved by Alberta Transportation, it is recommended that some form of implementation be carried out so the entire community that is affected by the highway can return to normal. The first step should be for Alberta Transportation to advise the M.D. of Bighorn, the Summer Village of Waiparous and the M.D. of Rocky View of the decision. It is further recommended that Alberta Transportation commence right of way discussions particularly with two landowners that are known to be impacted by the alignment in the Summer Village so they have considerable time to adjust and relocate. This will be a controversial stage of the implication, however, once completed it will establish for all concerned the future alignment for Highway 40.

Intersection details, access management, right of way requirements, drainage assessments, utilities, costs and future design considerations were also included in the study.